

REMARKS

I. Introduction

Claims 1-37 are pending in the application, and claims 1-37 were examined. The Examiner withdraws her rejection over the combination of Hara et al., U.S. Patent No. 6,312,115 (hereinafter "Hara") in view of Hayakawa et al., JP 404135862. However, the Examiner newly rejects claims 1-37 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hara in view of Hasegawa et al., JP Patent No. 62095225 (hereinafter "Hasegawa").

Additionally, the Examiner rejects claims 13 and 16 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

II. Claim Rejections -- 35 U.S.C. § 112, Second Paragraph

Claims 13 and 16 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly "being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention". Specifically, the Examiner states that it is still unclear what "lyophobic part" is and how it is read on the preferred embodiment or can be determined on the drawings, and the Examiner requests appropriate correction or clarification. Applicants traverse the rejection of claims 13 and 16 for at least the following reasons.

Claims 13 and 16 recite the same limitation of **wherein said liquid container has a lyophobic part therein which is lyophobic to said liquid in said liquid container**. Applicants submit that both the ordinary meaning of lyophobic and Applicants' thorough discussion of the use of a lyophobic part or parts in the claimed invention satisfy the requirement of § 112, second paragraph, in sufficiently pointing out and distinctly claiming the subject matter of the claimed

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invention. Accordingly, the rejection of claims 13 and 16 is traversed. It may assist the Examiner's understanding to carefully review and consider Applicants' discussion of an illustrative, non-limiting use of a lyophobic part or parts at, by way of example, page 36, line 21 to page 43, line 21.

Furthermore, it may also assist the Examiner's understanding to carefully review Applicants' Fig. 15, illustrating a material lyophobic to a liquid. *See, e.g.*, Applicants' page 36, lines 24-37. Likewise, it may assist the Examiner to refer to Applicants' Fig. 16A, which is a non-limiting comparison example comprising a sectional view of the part of the actuator 106 attached to the side wall of the container body 1, having no lyophobic part. Conversely, Applicants' Fig. 16B, which is a non-limiting sectional view of the part of the actuator 106 attached to the side wall of the container body 1, has a lyophobic part. *See, e.g.*, Applicants' page 37, lines 14-37.

Additionally, Applicants amend claims 13, 16, and 18, as shown in the attached Appendix, to further clarify that more than one lyophobic part may exist in the liquid container. Applicants respectfully submit that these amendment are not intended to narrow the scope of the original claims, but are rather for precision of language and to explicitly recite within the claim what was believed to have already been implicitly defined therein.

III. Claim Rejections -- 35 U.S.C. § 103(a)

Claims 1-37 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the combination of Hara in view of Hasegawa. Applicants overcome the rejection of claims 1-37 as follows.

A. Claims 1, 14, and 19

In rejecting claims 1, 14, and 19 as allegedly being unpatentable over the combination of Hara and Hasegawa, the Examiner acknowledges that Hara fails to disclose, teach or suggest "a piezoelectric device for detecting a consumption condition of said liquid in said liquid container", as recited in claims 1, 14, and 19. The Examiner relies on Hasegawa to make up for this acknowledged deficiency of Hara. Hasegawa describes a piezoelectric element 4 that is arranged so as to touch the ink 2 in the ink tank 1 via a thin film 5. *See, e.g.*, Abstract of Hasegawa. From this arrangement, depending upon the amount of ink that comes into contact with piezoelectric element 4, its vibration characteristics are altered, such that a remaining amount of ink can be detected by measuring these vibration characteristics, for example with a frequency counter. *See, e.g.*, Abstract of Hasegawa.

Claims 1, 14, and 19 all recite the feature of "said piezo-electric device being provided with a cavity connecting to an inside of said liquid container". The piezoelectric element 4 of Hasegawa appears to disclose a cavity, and the cavity is arguably connected to the inside of the ink tank 1. *See, e.g.*, Fig. 4 of Hasegawa. However, Applicants amend claims 1, 14, and 19 to further clarify that the cavity contacts the ink. The combination of Hara and Hasegawa fails to disclose, teach or suggest "a piezo-electric device . . . being provided with a cavity . . . and said cavity contacting said liquid", as recited in amended claims 1, 14, and 19. Instead, Hasegawa discloses that the piezoelectric 4 touches the ink 2 via a thin film 5 and not via a cavity. *See, e.g.*, Abstract and Figs. 2-5 of Hasegawa.

Furthermore, claims 1, 14, and 19 insure that when a liquid container provided with the piezo-electric device is charged with liquid, the cavity of the piezo-electric device, which is adapted to contact the liquid but which is generally hard to fill with the liquid when the liquid is charged into the liquid container, can be easily filled with the liquid because "a pressure in said liquid container [is reduced] to a pressure lower than an atmospheric pressure". *See, e.g.*, Applicants' page 19, lines 3-30.

Thus, as amended, claims 1, 14, and 19 are patentable over the combination of Hara and Hasegawa.

B. Claims 2-13, 15-18, and 20-37

Additionally, claims 2-13, 15-18, and 20-37 are patentable over the combination of Hara and Hasegawa at least by virtue of their dependency.

IV. Examiner's Response to Applicants' Arguments

Applicants respectfully submit that the Examiner's response to Applicants' arguments filed on April 3, 2002 are moot in light of the Examiner's withdrawal of the earlier rejection over the combination of Hara and Hayakawa.

V. Proposed Drawing Correction

The Examiner failed to acknowledge receipt of and indicate approval of the proposed drawing correction (for Fig. 12) that Applicants filed on April 3, 2002. Consequently,

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Applicants respectfully request that the Examiner acknowledge receipt of and indicate approval of the proposed correction to Fig. 12 before or in the next Action.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A liquid charging method for charging a liquid container with a liquid, said liquid container being provided with a piezo-electric device for detecting a consumption condition of said liquid in said liquid container, said piezo-electric device being provided with a cavity connecting to an inside of said liquid container and said cavity contacting said liquid, comprising the steps of:

reducing a pressure in said liquid container to a pressure lower than an atmospheric pressure; and

charging said liquid container with said liquid.

13. (Amended) A liquid charging method according to Claim 1, wherein said liquid container has ~~a~~ at least one lyophobic part therein which is lyophobic to said liquid in said liquid container.

14. (Twice Amended) A liquid container comprising:
a container body; and

a piezo-electric device for detecting a consumption condition of a liquid in said container body, said piezo-electric device being provided with a cavity connecting to an inside of said container body and said cavity contacting said liquid;

wherein an internal pressure of said container body is reduced to a pressure lower than an atmospheric pressure, and

wherein said container body is charged with a liquid.

16. (Amended) A liquid container according to Claim 14, wherein said liquid container has ~~a~~ at least one lyophobic part therein which is lyophobic to said liquid in said liquid container.

18. (Amended) A liquid container according to Claim 16, wherein said at least one lyophobic part includes an inner side of said cavity.

19. (Amended) A method for manufacturing a liquid container comprising the steps of:

preparing a liquid container having a container body for containing a liquid and a liquid feed port for feeding said liquid in said container body to an outside, and a piezo-electric device for detecting a consumption condition of said liquid in said container body, said piezo-electric device being provided with a cavity connecting to an inside of said container body and said cavity contacting said liquid;

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forming a lyophobic part in said piezo-electric device, said lyophobic part being lyophobic to said liquid in said container body;

attaching said piezo-electric device to said liquid container; and

charging said container body with said liquid using a liquid charging method, said liquid charging method comprising the steps of reducing a pressure in said container body to a pressure lower than an atmospheric pressure and charging said container body with said liquid.